

L Number	Hits	Search Text	DB	Time stamp
1	97	polymeriz\$3 near polymer near mixture	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/08 17:50
2	2	(polymeriz\$3 near polymer near mixture) and inspect\$3	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/08 17:54
3	0	(polymeriz\$3 near polymer near mixture) and surface near inspection	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/08 17:54
4	5	surface near inspection and polymer near mixture	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/08 17:59
5	0	(removing and processing) near (polymeriz\$3 near polymer near mixture)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/08 18:00
7	1	((remov\$3 and process\$3)and (polymeriz\$3 near polymer near mixture)) and inspection	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/08 18:00
6	52	(remov\$3 and process\$3)and (polymeriz\$3 near polymer near mixture)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/08 18:01

US-PAT-NO: 4902370  
DOCUMENT-IDENTIFIER: US 4902370 A  
TITLE: Synthetic based cold seal adhesives

----- KWIC -----

The polymers selected for the base and secondary polymers are selected from a wide array of synthetic polymers, copolymers, and polymer mixtures, including acrylic copolymers and styrene butadiene rubbers (SBR's) as base polymers and styrene-acrylic copolymers as secondary polymers. Thus, the instant invention permits the use of synthetic materials in applications in which natural latex rubber was previously the only useful polymer. An additional benefit of the use of synthetic polymers is that the adhesive will be characterized by lower odor, longer shelf life, greater mechanical stability, and lower foaming than its natural polymer counterpart.

The soft polymers comprise the base polymer composition and are characterized by a Tg of -40.degree. to -60.degree. C., preferably -50.degree. to -60.degree. C., more preferably -54.degree. C., and a Williams plasticity number of 2.5 to 2.9 preferably 2.7. Thus these polymers are quite tacky and impart a high degree of pressure sensitivity to the adhesives. Virtually any synthetic polymer meeting these criteria can be used in the adhesive compositions of this invention, but preferred polymers include acrylic copolymers such as a copolymer comprising 60% (by wt.) butyl acrylate, 30% (by wt.) 2-ethylhexyl acrylate, and 10% vinyl acetate;

and styrene butadiene rubbers. Additionally, mixtures of polymers can also be employed in this capacity, with the main criterion for selection being the Tg and plasticity number of the overall mixture; thus, it is not essential that each polymeric component have the requisite properties, only that the polymer mixture possess them. Additionally, in some cases (e.g. with certain acrylic copolymers) it may be necessary to crosslink the polymers to bring its plasticity number to an acceptable level.

The hard polymers and/or resins comprise the secondary polymer composition and are characterized by a Tg of -25.degree. to +5.degree. C., preferably -15.degree. to 0.degree. C., more preferably -10.degree. C. and a Williams plasticity number of 5.0 to 5.6, preferably 5.0 to 5.3, more preferably 5.1. Thus these polymers reduce the overall tack and pressure sensitivity of the adhesive composition, permitting its use as a cold seal adhesive. Any polymer meeting these criteria is useful as in the compositions of this invention, but preferred polymers include styrene-acrylic and ethylene vinyl acetate copolymers. Also, as was the case with the soft polymers, mixtures of hard polymeric or hard resin components may also be employed so long as the Tg and plasticity number fall within the acceptable range.

The adhesive compositions may also contain minor (<1% by wt.) amounts of optional materials which serve to augment certain desirable properties of the system. These materials include commercially available antifoaming compounds such as Bevaloid 6681 to 6603, which can be present in an amount ranging from about 0.1 to about 0.5% (by wt.); wetting agents such as sulfosuccinates (e.g.

Aerosol MA 80), which can be present in an amount ranging from about 0.2 to about 0.6% (by wt.); and antiblocking agents, such as Aquacer 608, which can be present in an amount up to about 0.5% (by wt.). The compositions listed are given by way of example only; virtually any compound having the desirable properties can be employed in this regard so long as it is compatible with the polymer mixture.

Based on the blocking peel value and a subjective visual inspection of the surfaces after this determination, the probability of observing blocking was determined. This was rated on a scale of 1-5. Generally, a value of 4 or less is acceptable for cold seal adhesives.